

compared; but this and other matters dealt with are beyond the limits of our present notice.

In "The Principles of Fishery Legislation" the Right Hon. G. Shaw Lefevre, proceeding to deal with the sea fisheries, exclusive of Crustacea and littoral forms, recalls the circumstances which led up to the passing of the Sea Fisheries Act of 1868—the result of an inquiry before a Commission of which he was himself a member. This Act, essentially one repealing restrictive legislation and giving increased liberty, has lately, as our readers doubtless know, been much under discussion, and the statistics here brought forward speak for themselves as to the wisdom and successful working of the laws then laid down. When we consider the state of the question, as reviewed by the author, we must admit that to alter would be to mar such statutes as these, unless prompted by fresh acquisitions to our knowledge. Speaking of the littoral species, the author shows that restrictive action has exercised no beneficial influence whatever upon our oyster fisheries, and in connection with this subject good evidence has been brought before the Conference to show that actual harm has often been done by premature legislation. These considerations all point to a conclusion, reiterated again and again in the papers before us, and affording consolation to all save a small faction, which pleads injury, but for what reason we know not. This valuable paper is supplemented by one upon "The Basis for Legislation on Fishery Questions," by Lieut.-Col. F. G. Solá, Secretary to the Spanish Commission. Much of this paper is necessarily taken up in discussing Spanish fisheries, but the moral points in the direction indicated above. Speaking of "an absolutely restrictive system," the writer ably remarks that, "under the shade of those abuses established, recognised, or tolerated by former laws, there will have grown up a crowd of well-to-do interests, which it is not possible to disregard." These words and those which follow, will bear all the consideration we can give them.

Setting aside the popular sensational aspect of the "Fish Markets" question, of which those in authority have lately heard enough, that of "Fish Transports and Fish Markets" demands early consideration and prompt action. His Excellency Spencer Walpole, in dealing with it, confines himself to that "internal traffic" in which lie many sources of evil. Speaking of the necessity for railway reform, the author does not, as might be imagined, advocate State management, but seeks solution of the "suicidal policy" now existing, by insuring—between land and water carriage—a "healthy competition." All we can hope is that the matter may be thus easily rectified, meanwhile the fact remains that the future of great and important fisheries must depend upon the issue. The author enters into a discussion of the market question, but as so much concerning this rests with the City Corporation we await their views. Despite the protest lodged by Mr. Sayer on p. 20, we cannot but regard the silence of, and want of concerted action among, the Billingsgate men, as an unhealthy sign.

The perils of a fishing life are patent to all, and when we hear a cry raised on all hands for increased harbour accommodation, and read that the failure of our fisheries is often due to want of weather forecasts, it is obvious that an important claim is established. Mr. Scott, in a paper on "Storm Warnings," brings a well-known experience to bear upon this matter, and compares our own condition and apparatus with those of other countries, notably the United States, Germany, and Holland. Our greatest need at present is shown to be want of observatories on the west coasts of Ireland and Scotland, and the author points out the significant fact that "storm signals are hoisted at 111 stations only over the whole United States, while we in these islands have nearly 140 for a much smaller area." Speaking of the famed American storm-warnings, the need of mid-ocean observatories is

discussed, as the storms almost invariably "change their character *en route*." Much other valuable information is embodied in this paper.

Prof. Lankester, writing on "The Scientific Results of the Exhibition," after making some admirable remarks about the "so-called practical man" and other topics, sets up a plea for a zoological observatory or "station." While no one will fail to enter into the spirit of his paper, we are of opinion that the plan—as concerning fisheries alone—need not be so elaborate as that suggested by him. No subject has created a greater revolution in the minds and actions of fishermen of late, than the discovery of Profs. Sars and Malm that the eggs of certain of our deep-sea fishes develop at the surface, and even were this not so no one would gainsay Prof. Lankester's cry of "more zoology." When we read that "the herring fishery is a lottery," and that simply because we know nothing of the real nature and causes of the movements of those fishes, it is quite obvious in what direction our earliest observations must be pursued. For this purpose a transportable zoological laboratory, with proper boats and appliances, such as that used in the recent successful experiments in the Netherlands, would amply suffice, and we conceive of such as best embodied in "A National Fishery Society," for which Mr. Fryer urges a strong, and it seems to us an exceedingly just, claim. All modern advance in the fishing industry points to the conclusion that Governmental action must be slight but firm; this being so, both common sense and precedent show it to be absolutely necessary that some such mediating body as that which the author would have established, should exist. Such a society would, of necessity, acquire in time all necessities for work and progress, but, until this stage at least is reached, Britain—whose waters are second to none—cannot hope to hold her own in the matter of International Fisheries. We heartily recommend our readers to reflect upon a speech, made by Mr. Birkbeck, M.P., Chairman of the Executive Committee, which follows the aforementioned paper.

Such are the aims and scope of the Literature of the Great International Fisheries Exhibition, and when the remaining publications are forthcoming it will form a collection upon which both the fishermen and all concerned must be congratulated. It has been impossible to do more than indicate the general line of work in this brief notice, no note having been taken of the extent to which certain papers overlap; it will be obvious, however, where abuse lies, where reform is needed, and along what lines the expected "outcome" must proceed.

The style of these books, produced by Messrs. W. Clowes and Sons, leaves nothing to be desired; the few typographical errors which occur being unavoidable in dealing with the technicalities of such an extensive subject.

NOTES

THE adjudication of medals for the present year by the Council of the Royal Society is as follows:—The Copley Medal to Prof. Sir William Thomson, F.R.S., for (1) his discovery of the law of the universal dissipation of energy; (2) his researches and eminent services in physics, both experimental and mathematical, especially in the theory of electricity and thermodynamics; a Royal Medal to Prof. T. A. Hirst, F.R.S., for his researches in pure mathematics; a Royal Medal to Prof. J. S. Burdon-Sanderson, M.D., F.R.S., for the eminent services which he has rendered to physiology and pathology, especially for his investigation of the relations of micro-organisms to disease, and for his researches on the electric phenomena of plants; the Davy Medal to Marcellin Berthelot, For. Mem. R.S., and Prof. Julius Thomsen for their researches in thermo-chemistry.

PROF. HUXLEY and Sir Joseph Hooker having been elected members of the Salters' Company, were present at a dinner given by the Company on Tuesday evening, and both took praiseworthy advantage of the opportunity to remind our "City men" of some wholesome truths. Prof. Huxley said he had no doubt that an immense field of usefulness lay open for the Guilds and the Corporation of London. Happily it was a field which was not altogether unploughed, and one in which the road had been practically shown towards doing an immense amount of good. He wished to express an opinion which he had formed with great care, and which he uttered with a full sense of responsibility, that the work which had been undertaken in the name of the City and Guilds of London, and which had at present resulted in the foundation of an institute for technical education, was one of the greatest works, if properly comprehended, which had ever been taken in hand, whether they viewed it with reference to the commercial prosperity of the country, to its social organisation, or to the preservation of the condition of political equilibrium; for at the present time the wealth and prosperity of the country were a cloud generated out of the application of physical science, and taking that science away the cloud would vanish like any other baseless fabric of a vision. The future predominance of the commercial power of England depended upon whether its merchants had the wisdom to appreciate the gifts which science gave them. If, however, these elements were disregarded, London would perish as surely as Carthage. The social state and the preservation of the condition of political equilibrium depended, he argued, upon a proper knowledge of science. The institution to which he had referred provided for all those requirements, and it was one of the greatest privileges of the office which he at present held that he should be associated with those engaged in the organisation of this system, and who, he trusted, would carry on the enterprise to a successful conclusion.

THE death is announced of the well-known American mineralogist, Mr. Lawrence Smith, at Louisville, Kentucky. Mr. Smith devoted himself mainly to the investigation of meteorites, and did much to increase our knowledge of these bodies. He was a corresponding member of the Paris Academy of Sciences.

CAPT. DAWSON and party of the British Circumpolar Expedition, which wintered at Fort Rae, Great Salt Lake, arrived safe and well at Winnipeg on November 2, having succeeded in crossing the height of land at Portage la Loche before the closing of the navigation by ice, which some of the resident authorities of the Hudson's Bay Company in the north-west thought they would be unable to do if detained on Slave Lake until the end of August.

M. CHARCOT, the chief surgeon of La Salpêtrière, in Paris, has been nominated member of the Academy of Sciences.

It has been arranged that the tercentenary of Edinburgh University shall be celebrated on April 16, 17, and 18 next.

THE results of the late Cambridge higher local examination were very discouraging as regards Group E (Natural Science). Only two out of sixty-six candidates gained a first class, and thirty-one failed. The following are extracts from the Examiners' reports:—Elementary Paper: The answers indicated an imperfect comprehension of principles, and an inadequate practical acquaintance with the subject-matter of the various sciences. In Chemistry the papers as a whole were markedly inferior to those of last year, showing want of knowledge of any practical arrangements for the simplest experiments. In Physics the work of all the candidates was very poor. The general want of clearness and definiteness of expression was very noteworthy. No marks were gained for answers to the numerical questions, and in but few cases were they attempted. In Physical Geography and Geology the answers were on the whole unsatisfac-

tory. The candidates seemed to have studied the subject chiefly in books, for though one or two showed proofs of having acquired some practical knowledge in the Museum, nearly all, when describing the physiography and stratigraphical geology of an English district, gave indications that their knowledge was gained by reading, and not by actual observation in the field. In Physiology the answers of different candidates were very unequal. Some were extremely good, while a considerable number showed ignorance of the most rudimentary facts. There was very little evidence of a personal acquaintance with minute anatomy. In Zoology most of the answers were characterised by vagueness, want of precision, and a marked, often grotesque, ignorance of the meaning of the most ordinary technical terms. The reading of most of the candidates seems to have been very diffuse and unintelligent, while not one of the candidates had any real grasp of the principles of the subject. In Botany the answers were very weak. They indicated a tendency to neglect the external morphology and anatomy, and to pass on to special morphology and life-histories of the lower forms before the above-named branches of the subject had been properly mastered.

AMONG the lectures to be given at the London Institution during the coming season are the following:—December 3, Mr. G. J. Romanes, F.R.S., *Instinct*; 6, Rev. W. Green, the *High Alps of New Zealand*; 13, Prof. G. W. Henslow, the *Glaciers of the Alps*; 20, Prof. W. H. Flower, F.R.S., *Whales*; 27, Prof. H. Armstrong, F.R.S., *Water (juvenile lecture)*; 31, Dr. Rae, F.R.S., the *Eskimos and Life among them*. January 3, Dr. Donald MacAlister, *How a Bone is built*; 7, Mr. H. Seebohm, *Arctic Siberia*; 10, Mr. Alfred Tylor, *Celtic and Roman Britain*; 17, Mr. H. Dixon, *Explosives*. February 7, Mr. Norman Lockyer, F.R.S., the last two *Eclipses of the Sun*; 18, Mr. J. Bryce, M.P., D.C.L., *An Ideal University*; 21, Prof. R. S. Ball, F.R.S., the *Doctrine of Evolution applied to the Solar System*; 25, Dr. E. B. Tylor, F.R.S., the *Three Sources of History—Records, Monuments, and Social Laws*. March 6, Prof. Schuster, F.R.S., the *Aurora Borealis*.

HERR CARL ROHRBACH of Leipzig has lately described a method of procuring a fluid having extraordinarily high refractive and dispersive powers. 100 parts of iodide of barium are mixed with 130 parts of scarlet biniodide of mercury. About 20 c.c. of distilled water are added to the powders, and they are then stirred up with a glass rod while heated in a test tube plunged into an oil bath previously warmed to 150° or 200° C. A fluid double iodide of mercury and barium is formed, which is then poured into a shallow porcelain dish and evaporated down until it acquires a density so great that a crystal of epidote no longer sinks in it. When cold, even topaz will float in it. It is then filtered through glass-wool. The fluid so prepared has a density of 3.575–3.588, boils at about 145°, and is of a yellow colour. Its refractive index is 1.7755 for the C line, and 1.8265 for the E line of the spectrum. For the two D lines of sodium the refractive indices are 1.7931 and 1.7933 respectively. So great is the dispersion that, using a single hollow prism with a refracting power of 60°, the dispersion between the two D lines is almost exactly 2' of angle.

THE latest official report of the Imperial German Post Office states that at the end of October the telephone was fully in operation in the following thirty-six cities and towns, within the Imperial postal territory (which does not include Bavaria or Württemberg):—Aix-la-Chapelle, Altona, Barmen, Berlin, Beuthen, Brunswick, Bremen, Bremerhaven, Breslau, Burstcheid, Charlottenburg, Chemnitz, Cologne, Crefeld, Deutz, Dresden, Düsseldorf, Elberfeld, Frankfurt-on-Main, Gebweiler, Geestmünde, Hamburg, Hanover, Harburg, Kiel, Königsberg, Leipzig, Magdeburg, Mayence, Mannheim, Mülhausen (in Alsace), Potsdam, Stettin, Strasburg, Sulzmat, and Wandsbeck. In

four other towns—Halle, Karlsruhe, M. Gladbach, and Rheydt—the arrangements for its introduction have progressed so far that it will most probably be in operation in them before the end of this year. It is therefore likely that by the end of 1883 forty towns within the Imperial German postal territory will possess the advantages of the telephone, against twenty-one last year, and seven in October, 1881.

THE programme of the Yorkshire College Students' Association for the present session is a varied and interesting one. A "Yorkshire College Photographic Club" has recently been formed, and has already a good roll of members, including several members of the College staff. A prize competition has been arranged, and the Society has every prospect of success. The secretary of the Photographic Club is Mr. W. O. Senior.

ONLY six months ago a Society of Natural Science was formed at Bournemouth, and already it has 103 members, the president being Prof. Allman, F.R.S. The Society being established upon the most comprehensive basis, recognises every department of physical science as coming within the scope of its investigations. It is open to all, without limitation of class or sex. During the past session various papers have been read, and during the summer months bi-weekly morning and evening walks were taken under the leadership of the appointed heads of sections for botany, entomology, marine and terrestrial zoology and geology. The Committee contemplate devoting part of its funds to be awarded annually as prizes for the best and most systematically arranged collections of natural history specimens, made solely by each exhibitor, as an inducement to the younger members to cultivate habits of careful observation and systematic study of nature. The Society held a very successful *conversazione* on the 7th inst. at Bournemouth, and so attractive was the exhibition connected therewith, that it was kept open the following day. Captain Hartley, chairman of the Bournemouth Improvement Commission, opened the *conversazione* by giving some account of the origin and objects of the Society. The exhibition was of a very varied and instructive character, and at intervals during the day short popular lectures were given on such subjects as air, sound, the moon, natural magic, while the Rev. G. H. West exhibited and explained from time to time various apparatus illustrating physical phenomena. Altogether the Society gives promise of a successful career.

MR. GEORGE MURRAY will deliver a lecture on the potato disease at the Parkes Museum of Hygiene, 74A, Margaret Street, Regent Street, on Thursday, the 22nd instant, at 8 p.m.

SEVERAL members of the French Chamber of Deputies having contended that the transmission of telegrams was not so easy with underground wires as with aerial lines, M. Cochery has invited a number of opponents and electrical engineers to demonstrate on the lines now in existence, that the difference, if there is any, is quite immaterial.

AT a recent meeting of manufacturers and artisans convened by the Mayor at Coventry, resolutions were enthusiastically carried in favour of the adoption of a system of technical education in the city. It is proposed to provide a building for the consolidation and extension of the science classes, a lecture-hall, and reading-room, with a reference library of works appertaining to trade and manufactures, and to establish in connection with these three workshops for the practical teaching of mechanics (toolmaking, weaving, and watchmaking). It is estimated that about 4000*l.* will be needed for the building, and 3000*l.* for the fixtures and equipment of the building and workshops, in addition to which it will be necessary to provide an annual income of at least 300*l.* Subscriptions and donations exceeding 1000*l.* were promised at the meeting.

THE piercing of the Arlberg Tunnel, which will be 10,270 metres long, thus ranking third in the world, was expected to be completed to-day. The work began on November 13, 1880, on the western and eastern sides simultaneously, and has therefore lasted just three years, instead of four, as was calculated. Special trains will bring over two hundred invited guests from Austria, Italy, and Switzerland, to witness the final boring and the connection of the two galleries.

MR. G. J. SYMONS writes to the *Times* to say that Miss Eleanor Nunes, who had been keeping an extremely accurate record of the fall of rain at Langtree Wick, Torrington, Devon, died last spring, having left the sum of 100*l.* to him "to be applied to meteorological purposes." Mr. Symons announces that he is prepared to consider applications from all parts of the kingdom for rain-gauges to be sent gratuitously on loan subject to very easy conditions, and to send them to all accepted applicants who reside five miles from any rain-gauge now at work, and the same distance from any other applicant.

THE *Romando* has arrived at Cherbourg after a journey of two months, from Cape Horn. The results of the wintering have been important, and the crew is in good health.

THE diminution of credit rendered inevitable by the state of French finances will bear very little on the Budget of Public Instruction; the work of building the Meudon Observatory will not be stopped, and is proceeding favourably.

WE learn from a trustworthy source that there is again talk of transporting the Paris Observatory to some distance from the city, to a site in the vicinity of the new Flammarion Observatory.

THE Portuguese Government has appointed the explorers Capello and Ivens to proceed again on an expedition to West Africa, for the purpose of completing their map of the province of Angola, and of exploring the Congo. The explorers will leave by the packet on December 6.

NEWS has reached Europe of the assassination of M. De Brazza, but it is conjectured that this is the French explorer's brother, and not the explorer himself.

IN our note on the Royal Society last week, Dr. Warren De La Rue's name was given incorrectly.

THE additions to the Zoological Society's Gardens during the past week include a Bonnet Monkey (*Macacus sinicus* ♂) from India, presented by Mr. C. R. Browne; two Red-tailed Guans (*Ortalia ruficauda*) from Tobago, West Indies, presented by Mr. Alfred C. Priestly; two Gold Pheasants (*Thaumalea picta* ♂♂) from China, presented by Mr. H. W. Tyler; two Bar-breasted Finches (*Munia nisoria*) from Java, presented by Mr. J. Abrahams; a Kestrel (*Tinnunculus alaudarius*), British, presented by Mr. John Colebrook, F.Z.S.; two Long-eared Owls (*Asio otus*), European, presented by Mr. C. Purnchard; a Masked Parrakeet (*Pyrrhuloxia personata*) from the Fiji Islands, presented by Miss J. D. Smith; two Alligators (*Alligator mississippiensis*) from the Mississippi, presented respectively by Mr. Roland Bridgett and Mrs. M. E. Symons; a Peregrine Falcon (*Falco peregrinus*), European, a Goffin's Cockatoo (*Cacatua goffini*) from Queensland, deposited; a Bennett's Wallaby (*Maculatus bennetti* ♀) from Tasmania, two Black Wallabys (*Maculatus ualabatus* ♂♂) from New South Wales, a Yellow-footed Rock Kangaroo (*Petrogale xanthopus* ♂) from South Australia, a Mexican Eared Owl (*Asio mexicanus*) from Mexico, a Downy Owl (*Pulsatrix torquatus*) from South America, an Annulated Worm Snake (*Vermeilla annulata*) from Western Australia, purchased.